

REMARKS

Claims 1, 8, 15, 26, 33, 39, 40, 46, and 57 are amended. Claims 7, 19, 20, 32, 44, 45, 52, 54, 46 and 60 are canceled. Claims 1-6, 8-18, 21-31, 33-43, 46-41, 46-51, 53, 55, 57-59 are pending in the present application.

Claims 1, 2, 4, 5, 9, 11, 13-18, 24-27, 29, 30, 34, 36, 38-41, 43, 46, 47, 49, 50, 53, 55 and 57-59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,503,780 ("Glenn '780") in view of U.S. Patent No. 5,932,875 ("Chung"). Applicant respectfully traverses this rejection.

Claim 1, as amended, recites a microelectronic imaging unit, comprising, *inter alia*, "a microelectronic die including an image sensor, . . . a cover unit over the image sensor, . . . and an optics unit having a substrate and an optic member attached to the cover unit, wherein the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die." Glenn '780 and Chung, whether considered alone or in combination, do not teach or suggest all the limitations of claim 1.

Glenn '780 discloses that a "package body 1418 encloses sides 102S of image sensor 102, . . . and window support 108." Col. 20, lines 44-46; Fig. 14. Glenn '780 further discloses that "package body 1418, in combination with window support 108, mechanically locks window 110 in place." Col. 20, lines 46-49; Fig. 14. However, Glenn '780 is entirely silent on "an optics unit having an optic member attached to the cover unit, wherein the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die," as recited in claim 1.

Chung likewise does not disclose all the limitations of the claimed invention. Chung discloses that a “lid 10 acts as a protective packaging for the image sensor 18” (col. 3, lines 29-30; fig. 1), and that the “wall 14 and top cover 16 surround and enclose the image sensor 18 to prevent damage to the image sensor 18 and the wire bonds.” However, Chung, like Glenn ‘780, is silent on “an optics unit having a substrate and an optic member attached to the cover unit, wherein the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die.” as recited in claim 1. Since Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 1, claim 1 and claims 2, 4, 5, 9, 11, 13 and 14 depending therefrom are patentable over the references.

Claim 15, as amended, recites limitations similar to claim 1, including, *inter alia*, “a microelectronic die including an image sensor, . . . a cover unit over the image sensor, . . . and an optics unit having an optic member attached to the cover unit, wherein the optics unit is integral with the window and the optic member has a first side in contact with the window and a second side located between the first side and the microelectronic die.” For at least the same reasons as stated above with respect to the patentability of claim 1, Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 15. Specifically, Glenn ‘780 and Chung are silent on “an optics unit having an optic member attached to the cover unit, wherein the optics unit is integral with the window and the optic member has a first side in contact with the window and a second side located between the first side and the microelectronic die,” as recited in claim 15. Since Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 15, claim 15 and claims 16-18, 24 and 25 depending therefrom are patentable over the references.

Claim 26 recites limitations similar to claim 1, including, *inter alia*, “a microelectronic die having a first side, a second side opposite the first side, and a

“perimeter having end surfaces; an image sensor on the first side of the die; . . . a cover unit over the image sensor, . . . and an optics unit having a substrate and an optic member attached to the cover unit, wherein the optic member has a first side in contact with the optics unit and a second side located between the first side and the microelectronic die.” For at least the same reasons as stated above with respect to the patentability of claim 1, Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 26. Specifically, Glenn ‘780 and Chung are silent on “an optics unit having a substrate and an optic member attached to the cover unit, wherein the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die,” as recited in claim 26. Since Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 26, claim 26 and claims 27, 29, 30, 34, 36, 38 and 49 depending therefrom are patentable over the references.

Claim 40 recites a plurality of microelectronic imagers having limitations similar to claim 15, including, *inter alia*, “a microfeature workpiece including a plurality of microelectronic dies, the individual dies having an image sensor, an integrated circuit electrically coupled to the image sensor, . . . a plurality of cover units over corresponding image sensors, . . . and a plurality of optics units, each corresponding to one of the plurality of cover units, each having an optic member attached to the corresponding cover unit, wherein the individual optics units are integral with the respective windows, each optic member having a first side in contact with the window and a second side located between the first side and the corresponding microelectronic die.” For at least the same reasons as stated above with respect to the patentability of claims 15, Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 40. Specifically, Glenn ‘780 and Chung are silent on “a plurality of optics units, each corresponding to one of the plurality of cover units, each having an optic member attached to the corresponding cover unit, wherein the individual optics units are

“integral with the respective windows, each optic member having a first side in contact with the window and a second side located between the first side and the corresponding microelectronic die,” as recited in claim 40. Since Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 40, claim 40 and claims 41-43 depending therefrom are patentable over the references.

Claim 46 recites a method of packaging a microelectronic imager having limitations similar to claims 15 and 40, including, *inter alia*, “providing a microelectronic die having an image sensor, . . . providing a cover unit having a window and a side member projecting from and integral with the window, . . . attaching the cover unit to the die over the image sensor; . . . and “attaching an optics unit having an optic member to the cover unit, wherein the optics unit is integral with the window and the optic member is formed with a first side in contact with the window and a second side located between the first side and the microelectronic die.” For at least the same reasons as stated above with respect to the patentability of claims 15 and 40, Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 46. Specifically, Glenn ‘780 and Chung are silent on “attaching an optics unit having a substrate and an optic member to the cover unit, wherein the optic member is formed with a first side in contact with the substrate and a second side located between the first side and the microelectronic die,” as recited in claim 46. Since Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 46, claim 46 and claims 47, 49, 50, 53 and 55 depending therefrom are patentable over the references.

Claim 57 recites a method of packaging a plurality of microelectronic imagers having limitations similar to claims 1, 26 and 46, including, *inter alia*, “providing a microfeature workpiece including a plurality of microelectronic dies, the individual dies having an image sensor, . . . providing a plurality of cover units, . . . attaching individual cover units to individual dies over corresponding image sensors; . . . and

“attaching a plurality of optics units having a substrate and an optic member to corresponding individual cover units, wherein each of the optic members has a first side in contact with the individual substrate and a second side located between the first side and the corresponding microelectronic die.” For at least the same reasons as stated above with respect to the patentability of claims 1, 26 and 46, Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 57. Specifically, Glenn ‘780 and Chung are silent on “attaching a plurality of optics units having a substrate and an optic member to corresponding individual cover units, wherein each of the optic members has a first side in contact with the individual substrate and a second side located between the first side and the corresponding microelectronic die,” as recited in claim 57. Since Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 57, claim 57 and claims 58 and 59 depending therefrom are patentable over the references.

Accordingly, Applicant respectfully requests that the 35 U.S.C. § 103(a) rejection of claims 1, 2, 4, 5, 9, 11, 13-18, 24-27, 29, 30, 34, 36, 38-41, 43, 46, 47, 49, 50, 53, 55 and 57-59 be withdrawn.

Claims 3, 6, 28, 31, 42, 48 and 51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Glenn ‘780 in view of Chung, and further in view of U.S. Patent No. 6,734,419 (“Glenn ‘419”). Applicant respectfully traverses this rejection.

Claims 3 and 6 depend from claim 1. As set forth above, Glenn ‘780 and Chung do not teach or suggest all the limitations of claim 1. Glenn ‘419 does not supplement their inadequacy. Glenn ‘419 discloses that an “[o]ptical element 107, such as a lens is mounted in a support 138.” Col. 8, lines 66-67; Fig. 2B. Glenn ‘419 further discloses that “lens support 138 is a cylindrical annulus having an interior cylindrical surface 140, which defines an aperture 142” and that “[l]ens 107 is positioned in aperture 142 such that lens 107 and lens support 138 also have a longitudinal axis

“coextensive with optical centerline 115.” Col. 9, lines 1-6; Fig. 2B. However, Glenn ‘419, like Glenn ‘780 and Chung, does not teach or suggest “an optics unit having a substrate and an optic member attached to the cover unit, wherein *the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die*,” as recited in claim 1 (emphasis added). Since Glenn ‘780, Chung and Glenn ‘419 do not teach or suggest all the limitations of claim 1, claims 3 and 6 depending therefrom are patentable over the references.

Claims 28 and 31 depend from claim 26. Claim 26 recites limitations similar to claim 1. For at least the same reasons as set forth above with respect to claim 1, Glenn ‘780, Chung and Glenn ‘419 do not teach or suggest all the limitations of claim 26. Specifically, none of the references teach or suggest “an optics unit having a substrate and an optic member attached to the cover unit, wherein the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die,” as recited in claim 26. Since Glenn ‘780, Chung and Glenn ‘419 do not teach or suggest all the limitations of claim 26, claims 28 and 31 depending therefrom are patentable over the references.

Claim 42 depends from claim 40. Claim 40 recites limitations similar to claims 1 and 26. For at least the same reasons as set forth above with respect to claims 1 and 26, Glenn ‘780, Chung and Glenn ‘419 do not teach or suggest all the limitations of claim 40. Specifically, none of the references teach or suggest “a plurality of optics units, each corresponding to one of the plurality of cover units, each having an optic member attached to the corresponding cover unit, wherein *the individual optics units are integral with the respective windows, each optic member having a first side in contact with the window and a second side located between the first side and the corresponding microelectronic die*,” as recited in claim 40 (emphasis added). Since Glenn ‘780, Chung and Glenn ‘419

do not teach or suggest all the limitations of claim 40, claim 42 depending therefrom is patentable over the references.

Claims 48 and 51 depend from claim 46. Claim 46 recites limitations similar to claims 1, 26 and 40. For at least the same reasons as set forth above with respect to claims 1, 26 and 40, Glenn '780, Chung and Glenn '419 do not teach or suggest all the limitations of claim 46. Specifically, none of the references teach or suggest "attaching an optics unit having an optic member to the cover unit, wherein the individual optics units are integral with the respective windows the optic member is formed with a first side in contact with the window and a second side located between the first side and the microelectronic die," as recited in claim 46. Since Glenn '780, Chung and Glenn '419 do not teach or suggest all the limitations of claim 46, claims 48 and 51 depending therefrom are patentable over the references.

Accordingly, Applicant respectfully requests that the 35 U.S.C. § 103(a) rejection of claims 3, 6, 28, 31, 42, 48 and 51 be withdrawn.

Claims 7, 8, 19, 20, 32, 33, 44, 45, 52, 54, 56 and 60 are canceled and their subject matter has been incorporated into their respective independent claims. As such, the rejection of these claims is moot. Furthermore, Applicant submits that the respective independent claims are patentable over Glenn '780 in view of Chung, and further in view of U.S. Patent No. 6,762,472 ("Loh").

As set forth above, Glenn '780 and Chung do not teach or suggest all the limitations of claims 1, 15, 26, 40, 46 and 57. Specifically, Glenn '780 and Chung are silent on "an optics unit having a substrate and an optic member attached to the cover unit, wherein the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die," as recited in

claims 1 and 26. Glenn '780 and Chung are also silent on "an optics unit having an optic member attached to the cover unit, wherein the optics unit is integral with the window and the optic member has a first side in contact with the window and a second side located between the first side and the microelectronic die," as recited in claim 15, and "a plurality of optics units, each corresponding to one of the plurality of cover units, each having an optic member attached to the corresponding cover unit, wherein the individual optics units are integral with the respective windows, each optic member having a first side in contact with the window and a second side located between the first side and the corresponding microelectronic die," as recited in claim 40." Likewise, Glenn '780 and Chung are silent on "attaching an optics unit having an optic member to the cover unit, wherein the optics unit is integral with the window and the optic member is formed with a first side in contact with the window and a second side located between the first side and the microelectronic die," as recited in claim 46, and "attaching a plurality of optics units having a substrate and an optic member to corresponding individual cover units, wherein each of the optic members has a first side in contact with the individual substrate and a second side located between the first side and the corresponding microelectronic die," as recited in claim 57.

Loh does not supplement the adequacy of Glenn '780 and Chung in this respect. Loh discloses a signal communication structure 100 comprising "a body 132 encapsulating IC chip 104 and signal communication element 106" and that the "body 132 comprises an integral lens 134 aligned with signal communication element 106." Para. [0027]; Fig. 1 (patent not yet published). However, as depicted in Fig. 1 of Loh, the lens 134 does not have a first side in contact with the body 132 and a second side located between the first side and the IC chip 104. Therefore Loh, like Glenn '780 and Chung, does not teach or suggest all the limitations of the recited claims.

Claims 10, 12, 21-23, 35 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Glenn '780 in view of Chung and further in view of U.S. Patent No. 5,753,857 ("Choi"). Applicant respectfully traverses this rejection.

Claims 10 and 12 depend from claim 1. Claims 35 and 37 depend from claim 26. As set forth above, Glenn '780 and Chung do not teach or suggest all the limitations of claims 1 and 26. Specifically, Glenn '780 and Chung are silent on "an optics unit having a substrate and an optic member attached to the cover unit, wherein the optic member has a first side in contact with the substrate and a second side located between the first side and the microelectronic die," as recited in claims 1 and 26.

Choi does not supplement the adequacy of Glenn '780 and Chung in this respect. Choi discloses that "a glass lid 16 is attached by an adhesive 15 to the upper surface of the body 10 so as to cover the large hole." Col. 2, lines 40-41; Fig. 2. Choi further discloses that the body 10 is turned over so as to have the upper surface of the glass lid 16 face downward and that the package chip is inserted into the large hole formed in the plastic body 10, with the chip pads and a "light receiving area 17a facing downward," mounted on "fingers 13b extending from the outer portion 13a of the plate 13." Col. 2, lines 42-48; Figs. 2, 3. However, Choi is entirely silent on "an optics unit having a substrate and an optic member attached to the cover unit," as recited in claims 1 and 26. Since none of Glenn '780, Chung or Choi teach or suggest all the limitations of claims 1 and 26, claims 10, 12, 35 and 37 depending respectively therefrom are patentable over the references.

Claims 21-23 depend from claim 15. As set forth above, Glenn '780 and Chung do not teach or suggest all the limitations of claim 15. Specifically, Glenn '780 and Chung are silent on "an optics unit having an optic member attached to the cover unit, wherein the optics unit is integral with the window and the optic member has a

first side in contact with the window and a second side located between the first side and the microelectronic die," as recited in claim 15. Likewise, Choi is silent on this limitation. Since none of Glenn '780, Chung or Choi teach or suggest all the limitations of claim 15, claims 21-23 depending therefrom are patentable over the references.

Accordingly, Applicant respectfully requests that the 35 U.S.C. § 103(a) rejection of claims 10, 12, 21-23, 35 and 37 be withdrawn.

In view of the above amendment, Applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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